

**What Is Claimed Is:**

1. A surface mounting device comprising:

5 a plurality of conveyers installed at a predetermined position of a base frame and carrying a printed circuit board to a parts mounting work position or discharging the printed circuit board on which parts have been mounted, so that they can be moved in the X and Y-axis directions by a X-Y gantry installed on the  
10 base frame and can absorb parts supplied from a parts supply unit and the parts can be mounted by a head unit mounting the adsorbed parts on the printed circuit board; and

15 a plurality of multi-layer transfer units each installed at both ends of the plurality of conveyers and carrying the printed circuit board to the plurality of conveyers or loading the discharged printed circuit board.

20 2. The surface mounting device of claim 1, wherein the plurality of conveyors comprise a first conveyor installed at a predetermined position of the base frame and for carrying the printed circuit board supplied from the plurality of multi-layer transfer  
25 units to a parts mounting work position or discharging the printed circuit board on which parts have been mounted; and

a second conveyer installed at a predetermined position of the base frame and for carrying the printed circuit board supplied from the plurality of multi-layer transfer units to a parts mounting work position or  
5 discharging the printed circuit board on which parts have been mounted.

3. The surface mounting device of claim 2, wherein the first conveyor comprises a first conveyor guide  
10 frame for guiding the printed circuit board;

a plurality of first conveyor width adjusting rollers installed to the first conveyor guide frame at a predetermined position, respectively, and for guiding the first conveyor guide frame when controlling the  
15 width of the first guide frame;

a first conveyor lifting member installed to the inside of the first conveyor guide frame so that parts can be mounted on the printed circuit board or the printed circuit board can be lowered for discharging it;  
20 and

a plurality of conveyor driving units installed on an inner wall of the first conveyor guide frame so that the printed circuit board can be carried from the plurality of multi-layer transfer units carries to a  
25 parts mounting work position or the printed circuit board (P) on which parts are mounted can be discharged to the plurality of multi-layer transfer units.

4. The surface mounting device of claim 2, wherein the second conveyor comprises a second conveyor guide frame for guiding the printed circuit board;

5 a plurality of second conveyor width adjusting rollers installed to the second conveyor guide frame at a predetermined position, respectively, and for guiding the second conveyor guide frame when controlling the width of the second guide frame;

10 a second conveyor lifting member installed to the inside of the second conveyor guide frame so that parts can be mounted on the printed circuit board or the printed circuit board can be lowered for discharging it; and

15 a plurality of conveyor driving units installed on an inner wall of the second conveyor guide frame so that the printed circuit board can be carried from the plurality of multi-layer transfer units carries to a parts mounting work position or the printed circuit board (P) on which parts are mounted can be discharged  
20 to the plurality of multi-layer transfer units.

5. The surface mounting device of claim 1, wherein the plurality of multi-layer transfer units comprise a first multi-layer transfer unit installed at one end of  
25 the plurality of conveyers and for carrying the printed circuit board to the plurality of conveyers or loading the discharged printed circuit board; and

a second multi-layer transfer unit installed at the other end of the plurality of conveyers and for carrying the printed circuit board to the plurality of conveyers or loading the discharged printed circuit board.

6. The surface mounting device of claim 5, wherein the first multi-layer transfer unit comprises a plurality of first transfers stacked in a vertical direction for carrying the printed circuit board to the plurality of conveyers or loading the printed circuit board discharged from the conveyers;

a first lifting device for lifting/lowering the plurality of first transfers in the vertical direction so that they can be arranged at the height of the plurality of conveyers; and

a first horizontal driving device in which the plurality of first transfers are moved in the horizontal direction so that the plurality of first transfers can be arranged in the width of one end of the plurality of conveyers.

7. The surface mounting device of claim 6, wherein the plurality of first transfers comprise a first transfer guide frame for guiding each printed circuit board;

a plurality of first transfer roller installed to

the first transfer guide frame with a predetermined interval and rotated by receiving a rotation force generated from a rotating motor for moving the printed circuit board; and

5           a first belt member installed between the plurality of first transfer rollers and driven by the plurality of first transfer rollers, thereby carrying or loading the printed circuit board.

10           8. The surface mounting device of claim 6, wherein the first lifting device is any one of a ball screw driving device, a timing belt driving device, and a linear motor.

15           9. The surface mounting device of claim 6, wherein the first horizontal driving device is any one of a ball screw driving device, a timing belt driving device, and a linear motor.

20           10. The surface mounting device of claims 8 or 9, wherein the linear motor is any one of a coil mover and a permanent magnet mover.

25           11. The surface mounting device of claim 5, wherein the second multi-layer transfer units comprise a plurality of second transfers stacked in the vertical direction for carrying the printed circuit board to the

plurality of conveyors or loading the printed circuit board discharged from the plurality of conveyors;

a second lifting device for lifting/lowering the plurality of second transfers in the vertical direction  
5 so that they can be arranged at the height of the plurality of conveyers; and

a second horizontal driving device in which the plurality of second transfers are moved in the horizontal direction so that the plurality of second  
10 transfers can be arranged in the width of one end of the plurality of conveyers.

12. The surface mounting device of claim 11, wherein the plurality of second transfers comprise a  
15 second transfer guide frame for guiding each printed circuit board;

a plurality of second transfer roller installed to the second transfer guide frame with a predetermined interval and rotated by receiving a rotation force  
20 generated from a rotating motor for moving the printed circuit board; and

a second belt member installed between the plurality of second transfer rollers and driven by the plurality of second transfer rollers, thereby carrying  
25 or loading the printed circuit board.

13. The surface mounting device of claim 11,

wherein the second lifting device is any one of a ball screw driving device, a timing belt driving device, and a linear motor.

5           14. The surface mounting device of claim 11, wherein the second horizontal driving device is any one of a ball screw driving device, a timing belt driving device, and a linear motor.

10           15. The surface mounting device of claims 13 or 14, wherein the linear motor is any one of a coil mover and a permanent magnet mover.

15           16. The surface mounting method comprising the steps of:

          carrying a printed circuit board loaded to a first multi-layer transfer unit into a first conveyor under control of a controller;

20           discharging the printed circuit board carried to the first conveyor to a second multi-layer transfer unit under control of the controller;

          carrying the printed circuit board discharged to the second multi-layer transfer unit to a second conveyor under control of the controller; and

25           discharging the printed circuit board carried to the second conveyor to the first multi-layer transfer unit under control of the controller.

17. The surface mounting method of claim 16,  
 wherein in the step of discharging the printed circuit  
 board carried to the first conveyor to the second multi-  
 layer transfer unit under control of the controller, the  
 5 printed circuit board can be discharged the second  
 multi-layer transfer unit in a state that parts are  
 mounted or not mounted under control of the controller.

18. The surface mounting method of claim 16,  
 10 wherein in the step of discharging the printed circuit  
 board carried to the second conveyor to the first multi-  
 layer transfer unit under control of the controller, the  
 printed circuit board can be discharged the second  
 multi-layer transfer unit in a state that parts are  
 15 mounted or not mounted under control of the controller.

19. The surface mounting method comprising the  
 steps of:

carrying alternately a printed circuit board loaded  
 20 to a first multi-layer transfer unit to a first and a  
 second conveyors under control of a controller; and

mounting parts on the printed circuit board by a  
 head unit when the printed circuit board is carried to  
 the first and second conveyers, discharging the printed  
 25 circuit board disposed at the first and second conveyers  
 alternately onto the second multi-layer transfer unit  
 under control of the controller when parts mounting is



finished, loading the printed circuit board discharged from the second multi-layer transfer unit when the printed circuit board is discharged from the first and second conveyers alternately.

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20. The surface mounting method of claim 19, wherein in the step of carrying the printed circuit board loaded on the first multi-layer transfer unit to the first and second conveyers under control of the controller, the printed circuit board loaded on the first multi-layer transfer unit is carried to the first conveyer under control of the controller, and then is carried to the second conveyer after a predetermined time.

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